

WHAT IS CLAIMED IS:

1. A fuel vapor leak detecting apparatus, comprising:

a valve which is in a vapor purge system including a canister that is communicated with a fuel tank and an internal combustion engine, and which controllably closes the vapor purge system;

a pressurizing section which introduces atmospheric air into the vapor purge system to pressurize the vapor purge system; and

an internal-pressure measuring section which detects an internal pressure of the vapor purge system;

wherein the pressurizing section supplies the air for a predetermined time in a state where the vapor purge system is closed, and, when the internal pressure measured by the internal-pressure measuring section at the air supply is equal to or lower than a preset criterion pressure, it is judged that leak occurs.

2. The fuel vapor leak detecting apparatus according to claim

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wherein an elapsed time from beginning of pressurization to a timing when a difference in pressure rise rate between two pressure rise curves becomes large is set as a second predetermined time, the two pressure rise curves being respectively in cases where a leak hole corresponding to the

leak criterion exists, and where leak does not occur;

a pressure rise rate at a timing of an elapse of the second predetermined time in the case where a leak hole exists is previously stored as a predetermined pressure rise rate; and,

5 when a pressure rise rate in a case where the pressurizing section performs pressurization for the second predetermined time in a state where the vapor purge system is closed is equal to or smaller than the predetermined pressure rise rate, it is judged that leak occurs.

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3. The fuel vapor leak detecting apparatus according to claim 1, further comprising: a gasoline remaining amount grasping section which detects at least a remaining amount of gasoline in the fuel tank;

15 wherein the leak criterion is corrected on the basis of the remaining amount of gasoline detected by the gasoline remaining amount grasping section.

4. The fuel vapor leak detecting apparatus according to claim 20 1 wherein the pressurizing section includes an air pump.

5. The fuel vapor leak detecting apparatus according to claim 1, wherein the pressurizing section is a jet pump using a gasoline flow from a fuel pump which is submerged in the fuel tank.

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6. The fuel vapor leak detecting apparatus according to claim 1, wherein the pressurizing section is a jet pump using a discharge flow from a pressure regulator which adjusts a pressure of gasoline supplied from a fuel pump submerged in the fuel tank to the internal combustion engine.

7. The fuel vapor leak detecting apparatus according to claim 1, wherein the pressurizing section is a jet pump using a flow of return gasoline which is a residual as a result of consumption of gasoline in the internal combustion engine, the gasoline being supplied from a fuel pump submerged in the fuel tank to the internal combustion engine.

8. The fuel vapor leak detecting apparatus according to claim 1, wherein a jet pump which transfers gasoline from another chamber of a saddle type fuel tank by a flow of excess gasoline from the fuel pump is caused to function as the pressurizing section by, when leak is detected, switching a suction portion of the jet pump to a pipe for introducing atmospheric air.

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9. A fuel vapor leak detecting apparatus, comprising:
a bypass valve which is openable and closable, which is in a vapor purge system including a canister that is communicated with a fuel tank and an internal combustion engine, and which bypasses a two-way valve interposed between the fuel tank and

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the canister;

a reference orifice which is connected in series to the
bypass valve;

a communication valve which controls communication
5 between the canister and an ambient;

a pressurizing section which introduces atmospheric air
into the fuel tank; and

an internal-pressure measuring section which detects an
internal pressure of the fuel tank;

10 wherein a reference pressure rise rate at a timing when
the pressurizing section supplies the air for a second
predetermined time in a state where the communication valve
and the bypass valve are opened is set, and,

when a pressure rise rate at a timing when a time which
15 is twice the second predetermined time has elapsed after the
communication valve is closed is equal to or smaller than the
reference pressure rise rate, it is judged that leak occurs.

10. The fuel vapor leak detecting apparatus according to claim
20 9,

wherein a reference pressure rise rate at a timing when
the pressurizing section supplies the air for the second
predetermined time in a state where the communication valve
and the bypass valve are opened is set;

25 when a pressure rise rate at a timing when a time which

is twice the second predetermined time has elapsed after the communication valve is closed is equal to or smaller than the reference pressure rise rate, the bypass valve is closed; and,

when a pressure rise rate at a timing when a time which
5 is thrice the second predetermined time has elapsed after the bypass valve is closed is equal to or larger than the reference pressure rise rate, it is judged that leak occurs on a side of the canister, and, when the pressure rise rate at the timing is smaller than the reference pressure rise rate, it is judged
10 that leak occurs on a side of the fuel tank.

11. The fuel vapor leak detecting apparatus according to claim 9, further comprising: a gasoline remaining amount grasping section which detects at least a remaining amount of gasoline
15 in the fuel tank;

wherein the leak criterion is corrected on the basis of the remaining amount of gasoline detected by the gasoline remaining amount grasping section.

20 12. The fuel vapor leak detecting apparatus according to claim 9, wherein the pressurizing section includes an air pump.

13. The fuel vapor leak detecting apparatus according to claim 9, wherein the pressurizing section is a jet pump using a gasoline
25 flow from a fuel pump which is submerged in the fuel tank.

14. The fuel vapor leak detecting apparatus according to claim 9, wherein the pressurizing section is a jet pump using a discharge flow from a pressure regulator which adjusts a pressure of gasoline supplied from a fuel pump submerged in the fuel tank to the internal combustion engine.

15. The fuel vapor leak detecting apparatus according to claim 9, wherein the pressurizing section is a jet pump using a flow of return gasoline which is a residual as a result of consumption of gasoline in the internal combustion engine, the gasoline being supplied from a fuel pump submerged in the fuel tank to the internal combustion engine.

16. The fuel vapor leak detecting apparatus according to claim 9, wherein a jet pump which transfers gasoline from another chamber of a saddle type fuel tank by a flow of excess gasoline from the fuel pump is caused to function as the pressurizing section by, when leak is detected, switching a suction portion of the jet pump to a pipe for introducing atmospheric air.

17. A fuel supplying apparatus which is to be applied to a fuel vapor leak detecting apparatus, and which is to be disposed inside a fuel tank through an opening, comprising:

a fuel pump;

a fuel filter;

a jet pump;

an air intake pipe;

an internal-pressure sensor; and

5 an electrical connector

wherein the fuel pump, the fuel filter, the jet pump,
the air intake pipe, the internal-pressure sensor, and the
electrical connector are configured integrally with a flange
for closing the opening, or a support member continuous to the
10 flange.